

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (original) Surface-modified nanoparticles whose surface is covered completely or near-completely with
 - (A) modifying groups which
 - are attached covalently to the surface via at least one linking functional group (a) and
 - contain at least one inert spacer group (b) and
 - contain at least one reactive functional group (c) which is connected via the group (b) to the group (a) and is inert toward the reactive functional groups of the surface to be modified,
 - (B) modifying groups which
 - are attached covalently to the surface via at least one linking functional group (a) and
 - contain at least one inert group (d) attached to the surface via group (a) having a smaller hydrodynamic volume V_H than the inert spacer group (Ab), and
 - (C) modifying groups which
 - are attached covalently to the surface via at least one linking functional group (a) which contains at least one silicon atom,

- contain at least one inert group (e) attached to the surface via group (a), and
- have a smaller hydrodynamic volume V_H than the modifying group (A).

2. (original) Surface-modified nanoparticles as claimed in claim 1, wherein the hydrodynamic volume V_H can be determined by means of photon correlation spectroscopy or estimated using the equation

$$V_H = (r_{cont}/2)^3$$

in which r_{cont} is the effective contour length of a molecule.

3. (currently amended) Surface-modified nanoparticles as claimed in claim 1 or 2, wherein the reactive functional groups of the surface to be modified are hydroxyl groups.

4. (currently amended) Surface-modified nanoparticles as claimed in claim any of claims 1 to 3, wherein the linking functional group (Aa) contains at least one silicon atom.

5. (currently amended) Surface-modified nanoparticles as claimed in claim any of claims 1 to 4, wherein the inert spacer group (Ab) is an at least divalent organic radical R.

6. (currently amended) Surface-modified nanoparticles as claimed in claim any of claims 1 to 5, wherein the reactive functional group (Ac) is activable thermally, and/or with actinic radiation, or both thermally and with actinic radiation.

7. (currently amended) Surface-modified nanoparticles as claimed in claim 6, wherein the ~~thermally activable~~ reactive functional group (Ac) is thermally activable and is a blocked isocyanate group and the reactive functional group (Ac) which can be activated with actinic radiation is selected from the group consisting of groups containing at least one carbon-carbon multiple bond.

8. (currently amended) Surface-modified nanoparticles as claimed in claim any of claims 1 to 7, wherein the linking functional group (Ba) is selected from the group consisting of ether, thioether, carboxylate, thiocarboxylate, carbonate, thiocarbonate, phosphate, thiophosphate, phosphonate, thiophosphonate, phosphite, thiophosphite, sulfonate, amide, amine, thioamide, phosphorphide, thiophosphorphide, phosphonphide, thiophosphonamide, sulfonamide, imide, hydrazide, urethane, urea, thiourea, carbonyl, thiocarbonyl, sulfone and sulfoxide groups.

9. (currently amended) Surface-modified nanoparticles as claimed in claim any of claims 1 to 8, wherein the inert group (Bd) and the inert group (Ce) are monovalent organic radicals R².

10. (original) Surface-modified nanoparticles as claimed in claim 9, wherein the monovalent organic radicals R² are selected from the group consisting of aliphatic, cycloaliphatic, aromatic, aliphatic-cycloaliphatic, aliphatic-aromatic, cycloaliphatic-aromatic, and aliphatic-cycloaliphatic-aromatic radicals.

11. (currently amended) Surface-modified nanoparticles as claimed in claim
~~any of claims 1 to 10, wherein the inert groups (Ab), (Bd), and (Ce) contain at least one at least divalent functional group, and/or at least one substituent, or both.~~

12. (currently amended) Surface-modified nanoparticles as claimed in claim
~~any of claims 1 to 11, preparable prepared by reacting the reactive functional groups of the surface of nanoparticles for modification with~~

(A) at least one modifier containing

- at least one reactive functional group (a) which is reactive toward the reactive functional groups of the surface to be modified,
- at least one inert spacer group (b) and
- at least one reactive functional group (c) which is connected via the group (b) to the group (a) and is inert toward the reactive functional groups of the surface to be modified,

(B) at least one modifier containing

- at least one reactive functional group (a) which is reactive toward the reactive functional groups of the surface to be modified, and
- at least one inert group (d) having a smaller hydrodynamic volume V_H than the inert spacer group (Ab), and also

(C) at least one modifier having a smaller hydrodynamic volume V_H than the modifier (A), containing

- at least one reactive functional group (a) which contains at least one silicon atom and is reactive toward the reactive functional groups of the surface to be modified, and
- at least one inert group (e).

13. (currently amended) Surface-modified nanoparticles as claimed in claim 12, wherein the modifier (A) is selected from the group consisting of silanes of the general formula II:



- in which the indices and the variables have the following definitions:
- m and n are integers from 1 to 6;
- o is 0, 1 or 2;
- Ac is a group activable thermally and/or with actinic radiation, as defined above;
- R is an at least divalent organic radical, as defined above;
- R^2 is a monovalent organic radical, as defined above; and
- R^3 is a hydrolyzable atom or group.

14. (original) Surface-modified nanoparticles as claimed in claim 13, wherein the hydrolyzable atom R³ is selected from the group consisting of hydrogen atoms, fluorine atoms, chlorine atoms, and bromine atoms and the hydrolyzable group R³ is selected from the group consisting of hydroxyl groups and monovalent organic radicals R⁴.

15. (currently amended) Surface-modified nanoparticles as claimed in claim 14, wherein the monovalent organic radical R⁴ is selected from the group consisting of groups of the general formula III:



in which the variable Y stands for an oxygen atom or a carbonyl group, carbonyloxy group, oxycarbonyl group, amino group –NH– or secondary amino group –NR²– and the variable R² is as defined above.

16. (currently amended) Surface-modified nanoparticles as claimed in claim any of claims 13 to 15, wherein the silanes (A) of the general formula II are obtainable obtained by

(1) reacting polyisocyanates with blocking agents and with silanes of the general formula IV:



in which the variable Z stands for an isocyanate-reactive functional group and the variables R, R² and R³ are as defined above; or

(2) reacting compounds of the general formula V:



~~in which the index n and the variables Ac, R, and Z are as defined above with silanes of the general formula VI:~~



~~in which the index m and the variables R, R² and R³ are as defined above.~~

17. (currently amended) Surface-modified nanoparticles as claimed in claim any of claims 12 to 16, wherein the modifier (B) is selected from the group consisting of hydroxyl-containing compounds of the general formula VII:



~~in which the variable R² is as defined above.~~

18. (original) Surface-modified nanoparticles as claimed in claim 17, wherein the hydroxyl-containing compounds of the general formula VII are primary aliphatic alcohols.

19. (currently amended) Surface-modified nanoparticles as claimed in claim any of Claims 12 to 18, wherein the modifier (C) is selected from the group consisting of silanes of the general formula VIII:



~~in which the index p = 1, 2 or 3, and the variables R² and R³ are as defined above.~~

20. (currently amended) Surface-modified nanoparticles as claimed in claim
~~any of claims 1 to 19~~, wherein the nanoparticles for modification are selected from the group consisting of metals, compounds of metals, and organic compounds.

21. (currently amended) Surface-modified nanoparticles as claimed in claim 20, wherein the nanoparticles for modification are metals or compounds of metals, are selected from main groups three to five and transition groups three to six and one and two of the periodic system of the elements, plus the lanthanoids.

22. (currently amended) Surface-modified nanoparticles as claimed in claim 20 or 24, wherein the nanoparticles for modification are compounds of the metals are selected from the group consisting of oxides, oxide hydrates, sulfates, hydroxides, and or phosphates.

23. (currently amended) A process for preparing surface-modified nanoparticles as claimed in ~~any of claims~~ claim 1, to 22, which comprises comprising reacting the nanoparticles for modification in a first stage with at least one modifier (A) and also

in a second stage with at least one modifier (B) and in a third stage with at least one modifier (C) or

in the second stage with at least one modifier (C) and in the third stage with at least one modifier (B) or

in the second stage with at least one modifier (B) and at least one modifier (C).

24. (original) The process as claimed in claim 23, wherein the modifiers (A), (B), and (C) are used in an amount which is sufficient for the complete or near-complete coverage of the surface of the nanoparticles for modification.

25. (currently amended) A process for producing modified nanoparticles as claimed in ~~any of claims~~ claim 13 to 22, which comprises comprising jointly hydrolyzing and condensing at least one modifier (A) of the general formula II and at least one modifier (C) of the general formula VIII and then reacting the resultant polycondensates with at least one modifier (B).

26. (currently amended) A dispersion comprising surface-modified nanoparticles as claimed in ~~any of claims~~ claim 1 to 22 and/or surface-modified nanoparticles prepared by the process as claimed in ~~any of claims~~ 23 to 25 in aprotic solvents, and/or reactive diluents, or both aprotic solvents and reactive diluents.

27. (currently amended) The dispersion as claimed in claim 26, wherein the aprotic solvents, and/or reactive diluents, or both have with regard to the modifying groups (A) and (B) a Flory-Huggins parameter $\chi > 0.5$.

28. (currently amended) The dispersion as claimed in claim 26 or 27, having, based on its total amount, a solids content of at least 30% by weight.

29. (currently amended) The dispersion as claimed in claim 28, comprising at least one additive selected from the group consisting of polymeric and oligomeric binders, crosslinking agents, color pigments, and/or effect pigments, organic and inorganic, transparent and or opaque fillers, other nanoparticles different than the nanoparticles of the invention, UV absorbers, light stabilizers, free-radical scavengers, devolatilizers, slip additives, polymerization inhibitors, photoinitiators, initiators of free-radical and or cationic polymerization, defoamers, emulsifiers, wetting agents, dispersants, adhesion promoters, leveling agents, film formation auxiliaries, sag control agents (SCAs), rheological control additives (thickeners), flame retardants, siccatives, dryers, antiskinning agents, corrosion inhibitors, waxes; and flatting agents.

30. (currently amended) A composition comprising ~~The use of~~ the surface-modified nanoparticles as claimed in ~~claim any of claims 1, to 22, of the surface-modified nanoparticles prepared by the process as claimed in any of claims 23 to 25, or of the dispersion as claimed in any of claims 26 to 29 for producing~~ wherein the composition is a member selected from the group consisting of coating materials, adhesives, sealants, compounds based on engineering plastics, and or curable compositions.

31. (new) Surface-modified nanoparticles as claimed in claim 6, wherein the reactive functional group (Ac) can be activated with actinic radiation and contains at least one carbon-carbon multiple bond.

32. (new) A dispersion comprising surface-modified nanoparticles prepared by the process as claimed in claim 23 in aprotic solvents, reactive dilutents, or both aprotic solvents and reactive diluents.